

Amendments to the Drawings:

Please substitute the attached new formal FIGURES 1-20 for the previously filed FIGURES 1-20, filed September 30, 2003.

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REMARKS

Introduction:

Claims 1 through 65 were pending in the patent application when an Office Action mailed September 6, 2005, rejected Claims 1-65. The Office Action also objected to the figures informal and requested correction of informalities in the specification and Claims 34-36, 39-51, and 53.

By way of this Amendment, and without introducing new matter, the Applicants have amended the Figures, Specification, and the Claims. Applicants respectfully request entry of the amendment and reconsideration and allowance of all claims pending in this patent application.

Objections:

Objection to the Figures:

Without adding new matter, Applicant substitutes new formal FIGURES 1-7 for the previously filed FIGURES 1-7.

Objection to the Specification:

Without adding new matter, Applicant has amended the specification at page 5, line 17 to "is then detected" as suggested by the Examiner.

Objection to the Claims:

Without adding new matter, Applicant has amended Claims 34 as suggested by the Examiner to correct an incorrect dependent claim reference number. Claims 39 and 53 are cancelled.

Claim Rejections:

Rejection of Claims 1-65 under 35 U.S.C. § 103(a):

The Office Action rejected Claims 1-65 as being obvious under Nikoonahad. Applicants respectfully traverse.

The amendments claim correlating absorbance with *exposure of a composite substrate to heat greater than 300 degrees F.* Further embodiments measure absorbance *co-planar or in alignment with fibers* in the composite substrate. Additional embodiments correlate heat exposure by calculation of a difference between absorbances at two wavenumbers, with *the difference exceeding or being less than specified or threshold values.*

Nikoonahad (U.S. 6,919,957)

Nikoonahad discloses a specimen analysis system for analyzing *substrates for semiconductor fabrication* (Col 35, Ln 38-40). The system includes a stage and a processor, and an illumination system and detection system directing energy to the sample for detection and analysis (Col 38, Ln 4-44). Nikoonahad makes reference an infra-red light source as an illumination system in passing, but teaches a source emitting light with *wavenumbers greater than 5882 cm-1*, and adds a further reference to a xenon arc lamp emitting visible and *ultraviolet* light. Nikoonahad discloses *dividing* intensity of returned light by are reference amount to determine *dimensions* by fitting to a theoretical model of data for sizes. (Col 45, Ln 30-44). No reference is made to fiber-resin composites, heat exposure, temperatures, or subtraction of absorbances at a plurality of wavenumbers. Nikoonahad indirectly discloses transmitting an incident beam against a sample at different angles, but does not teach or suggest the selection of angles. However, Nikoonahad makes no reference to fibers, nor fiber alignment, nor measuring absorbance in alignment with fibers in a resin-fiber composite.

Amended Claims:

With a full reservation of all rights, proposed independent Claims 10, 22, 47, and 52 are amended to include elements correlating absorbance with heat damage and/or alignment with fibers in a resin-fiber substrate, elements not taught or suggested by Nikoonahad.

As noted, Nikoonahad is a system for reviewing defects and dimensions in semiconductor materials. These are not properly "analogous or cognate" use of an infrared detection system forming a basis for an obviousness rejection to the invention here. *Research Corp. v. Nasco Indus., Inc.*, 501 F.2d 358, 360 (7th Cir. 1974).

No reference is made in Nikoonahad to heat or heat exposure, or resin-fiber composites. A statement that optical measurements can be made to measure desired properties (Col 43, Ln 20-23) is not a (1) suggestion or motivation to use infrared absorbance for resin-fiber heat exposure, (2) provides no reasonable expectation of success, nor (3) does it include the claim limitations present here. MPEP 2143.

No motivation for the claimed invention here is presented in Nikoonahad. *In re Jones*, 958 F.2d 347 (Fed. Cir. 1992).

Application of general statements in Nikoonahad to the present invention is utilizing 20-20 hindsight during considerations of obviousness: "The way to avoid the "attraction of a hindsight-base obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. ... *Close adherence to this methodology is especially important in the case of less technologically complex inventions*, where the very ease with which the invention can be understood may prompt one to fall victim to the insidious effect of a hindsight syndrome where that which only the inventor taught is used against its teacher." *In re Dembiczak*, 173 F.3d 994, 999 (Fed. Cir. 1999), in part citing *In re Rouffet*, 149 F.3d 1350 (Fed. Cir. 1998).

Nikoonahad teaches towards different materials, different analyses, and different wavenumbers from the present invention. The cited art thus teaches away from the present invention, and should not be utilized for an obviousness rejection. MPEP §§ 2141.02; 2143.01.

As a result, a *prima facie* case for obviousness, and Claims 10, 22, 47, and 52 are patentable over Nikoonahad. Applicants specifically traverse any implied office notice of obviousness derived from Nikoonahad. The balance of the claims depend from allowable Claims 10, 22, 47, and 52 and are therefore allowable for the same reasons as their respective base claims, as well as the additional limitations in those claims.

The specific claims presented herein are discussed further below.

Claims 1-9.

Claim 1 is withdrawn. Amended Claim 2, Original Claim 3 and Amended Claims 5- 9 depend from allowable Claim 10, and contain additional limitations. Amended Claim 4 depends from allowable Claim 19 and contains additional limitations including a wavenumber taught away from by Nikoonahad..

Claims 10-22.

Amended now-independent Claim 10 is amended to include the limitations of Claim 1, and is further amended to include the limitation wherein *increased infrared absorbance* is correlated to exposure by the *resin-fiber* composite substrate to heat greater than 300 degrees F. These elements are not included in Nikoonahad.

Dependent Claim 12 is withdrawn. Dependent claims 11, and 13-18 include wavenumbers taught away from by Nikoonahad.

Dependent Claim 19 is amended to reference *subtraction* of absorbance of a *second* wavenumber from absorbance at a *first* wavenumber, and a resulting *difference* greater than a *threshold amount* reflecting exposure of the composite substrate to *heat greater than 300 degrees F*. These elements are not included in Nikoonahad.

Claims 22-46:

Independent Claim 22 is amended to include the limitation of transmitting the infrared beam *in a direction approximately in alignment with fibers in the sample*. Nikoonahad does not disclose fibers, fiber direction, or measurements in alignment with fibers in a sample.

Dependent Claim 23 is withdrawn. Dependent Claim 24 depends from allowable Claim 22 and contains further limitations.

Dependent Claim 25 depends from allowable Claim 22, and further includes the limitation that *increased absorbance reflects exposure by the composite sample to heat greater than 300 degrees F*. This element is not present in Nikoonahad.

Dependent Claim 27 is withdrawn. Dependent claims 26, and 28-33 include wavenumbers taught away from by Nikoonahad.

Dependent Claim 34 is amended to reference *subtraction* of absorbance of a *second* wavenumber from absorbance at a *first* wavenumber, and a resulting *difference* greater than a *threshold amount* reflecting exposure of the composite substrate to *heat greater than 300 degrees F*. These elements are not included in Nikoonahad

Dependent claims 35-36 include wavenumbers not disclosed and taught away from by Nikoonahad.

Dependent claims 37-38 depend from allowable Claim 37, and include limitations of filtered infrared beams.

Claim 39 is cancelled.

Amended dependent Claims 41 depends from allowable Claim 47 and includes a limitation of an infrared filter spectrometer.

Amended dependent Claims 42-46 depends from allowable Claim 47 and includes wavenumbers, subtraction of absorbances, and thresholds not present in nor suggested by Nikoonahad.

Claims 47-51:

Independent Claim 47 is amended to include limitations first and second wavenumbers corresponds with an infrared spectra of a *heat damaged composite surface*, deriving a first *difference* between the first infrared absorbance and the second infrared absorbance; and *quantitatively determining an amount of heat exposure by correlating the first difference to a plurality of reference samples exposed to various amounts of heat*. Nikoonahad does not include these elements.

Dependent Claims 49 and 51 are withdrawn.

Dependent Claims 48 and 50 include wavenumbers not disclosed and taught away from by Nikoonahad.

Claims 52-65:

Independent Claim 52 is amended to include the limitations *determining an alignment direction of fibers in the substrate* and transmitting an infrared beam onto the substrate *in alignment with the alignment direction* and *correlating the first infrared absorbance to a degree of heat exposure by comparison to a plurality of reference samples exposed to various amounts of heat, including at least one reference sample exposed to temperatures over 300 degrees F.* Nikoonahad does not include these elements.

Dependent Claim 53 is cancelled.

Dependent Claims 54-61 includes wavenumbers taught away from by Nikoonahad.

Dependent Claims 62-65 depend from allowable Claim 52 and include additional limitations of deriving a second infrared absorbance, subtracting absorbances, and wavenumbers not present in Nikoonahad.

Applicants therefore respectfully requests entry of the proposed amendments, cancelling of Claims 39 and 53, withdrawal of Claims 1, 12, 23, 27, 49, and 51, and allowance of pending Claims 2-11, 13-22, 24-26, 28-38, 40-48, 50, 52, and 54-71.

CONCLUSION

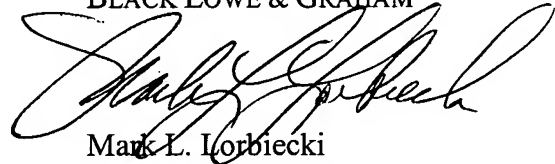
Applicant respectfully submits that all pending claims in this patent application are in condition for allowance. All of the claims are patentable over the cited references and are in condition for allowance.

Applicant respectfully requests entry of the amendment, and reconsideration and allowance of all pending claims in this patent application.

If the Examiner has questions, the Examiner is invited to contact the Applicant's attorney listed below.

Respectfully submitted,

BLACK LOWE & GRAHAM^{PLLC}



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MAIL CERTIFICATE

I hereby certify that this communication is being deposited with the United States Postal Service via first class mail under 37 C.F.R. § 1.08 on the date indicated below addressed to: MAIL STOP AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

January 6, 2004
Date of Deposit

Wendy Saxby
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